Saturday Program Meeting – 4/26/03

Machine Cut Dovetails

Jerry Shivers & John Phelps

Fourteen of us met in Jerry Shiver's shop to learn more about making dovetails – specifically, machine cut dovetails. Our club library has a lot of books about making dovetail joints. Check one out if you want more technical details than I can provide in this write-up.

Basics

Dovetail joints interlock the two parts together to make a really strong joint. The two basic parts are the tails (shaped like a bird's tail) and the pins (parts that fill in between the tails). The parts have complementary sizes and angles. There are two major types of dovetail joints:

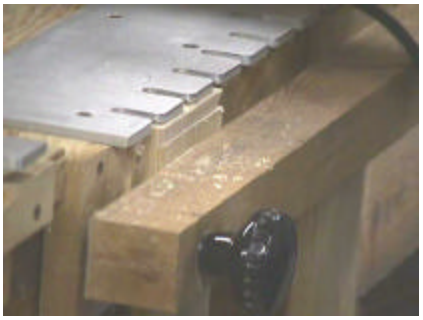
1. Through dovetails where the ends of both boards are visible – usually used for decorative corners on boxes
2. Half-blind dovetails where the end of one board is visible – usually used for drawers

And different techniques are used to cut each type.

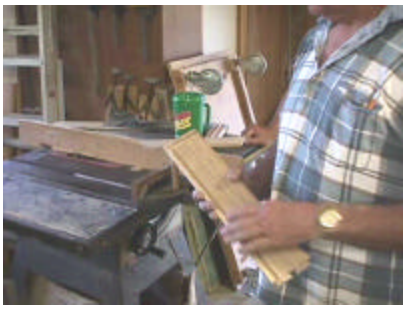
Drawers with Half-Blind Dovetails

Jerry Shivers demonstrated his technique for making drawers with half-blind dovetails. In this case, the dovetail joint is used for strength, so he only uses it for the joints at the front of the drawer. Most of Jerry's drawers are 'flush fit' drawers, i.e. they fit inside the opening and flush with the front of the face frame. Size your drawer in multiples of the spacing of your dovetail jig so you can have a half tail at the top and bottom and the groove for the drawer bottom will fall in a tail. Fit the drawer front ***precisely*** to the opening in the face frame. Leave a 1/16" gap around the edge. Jerry says spending extra time getting a perfect fit for the front helps ensure a good drawer.

The front and sides need to be exactly the same width. Both sides are cut to length at the same time to make sure they are exactly the same length and square. Set up your dovetail jig and cut the dovetails on the drawer front(s) and sides. Be sure the pieces are properly clamped in the jig. Keep splintering to a minimum by doing a shallow cut across the face of the board before you make the full cut for the tails and pins. Test fit the joint and make any necessary adjustments to the pieces. The joint should fit together with a light tap from your hand – that way you have plenty of room for the glue.



Now you can do the rest of the machining on the pieces. Jerry usually puts a 5-degree bevel profile on the drawer front with a raised panel bit. For the sides, he relieves the top edge about 1/8" and routes the edge with a bullnose bit. Then he cuts the groove for the bottom in the front and side panels and the dado for the back panel in the sides. Next, measure and cut the back panel about 1/32" narrower than the front, make it flush with the top of the sides and have it rest on the drawer bottom.



To assemble the drawer, glue the dovetail joints, glue the back to the sides and slip the bottom into place (don't glue it). Slip the drawer into the opening and position it exactly the way you want it. Use spacer shims on the front, back and sides of the drawer to position and hold the drawer until the glue dries. After the glue dries, use brads or nails to hold the bottom in place.

Case Goods with Through-Dovetails

John Phelps explained that through-dovetails are used when you need extra strong joints and don't mind (maybe even want) the end of the boards to show. This is usually the case for projects like boxes and cabinets. While there are numerous commercial jigs available, the pins have to be at least ¼" because of the router bits and the joints have to be sized to the jig spacing. John showed us a way to do the dovetails using a table saw to cut the pins and a band saw to cut the tails.

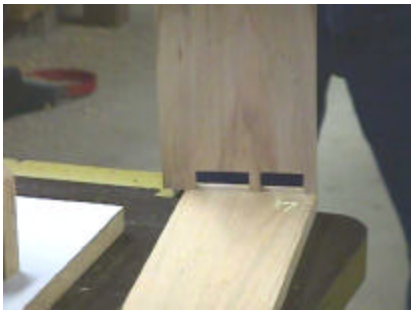
To cut the pins on the table saw, you need to

decide the angle of the pins and build a two- sided sled to position the wood as it goes through the saw. First, make the angle jig (like John is holding in his right hand). John likes a 1 in 6 angle, that is, for every 6 inches of length, it gets 1" wider. Use this angle jig to position both fences. Attach a good runner to the bottom of the sled – John likes the ones made with laminate. If the single runner is properly attached and sized, there is no need for a second runner. Put blade guards in place to protect your fingers. Use a ½" dado blade to cut the initial slots in the sled as well as the pins on your joint. Stop the saw when you finish cutting through the fence and install a stop block in the miter slot.

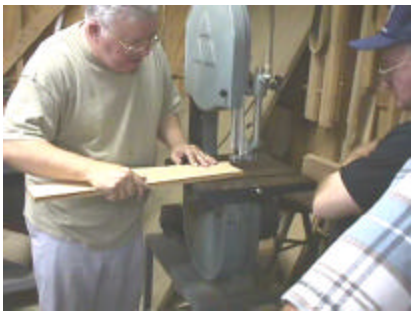
Mark the each piece of each joint, then decide the spacing for your dovetails and draw them on each end of the pin boards. With the face side toward the blade, carefully line up the marks with the edge of the cut on the sled and make the cut. Move to the corresponding side of the

next pin and repeat the cut. When you've finished these cuts on all of the pin boards, turn the sled around and cut the other side of the pins and clean out the waste.

Now, take the pin boards and transfer the pin

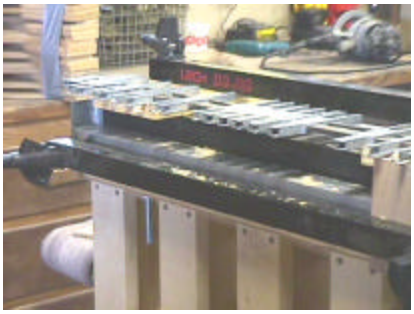


spacing to the matching tail board. You have to do this individually for each end of each tail board to compensate for any differences in the pins. Use the band saw fence along with the angle jig used to make



the sled as a guide and carefully cut each tail on the band saw. Finish cleaning up the tail with a chisel.

If you want to use a router to cut through



dovetails, John suggests the Leigh Jig. The fingers are adjustable and they're used cut the pins and the tails